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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/830,133

04/23/2004

Giorgio Sberveglieri

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EXAMINER

FITZGERALD, JOHN P

ART UNIT

PAPER NUMBER

2856

MAIL DATE

DELIVERY MODE

01/14/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|-----------------|--|--|
| Office Action Summary | Application No. | Applicant(s) TH | |
| | 10/830,133 | SBERVEGLIERI ET AL. | |
| | Examiner | Art Unit | |
| | John Fitzgerald | 2856 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8 and 9 is/are rejected.
- 7) ☒ Claim(s) 7 and 10-19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. The previous election of species requirement is hereby waived by the Examiner.

Drawing Objections

2. Figures 1-7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by US 4,457,161 to Iwanaga et al. Iwanaga et al. disclose a gas sensor (see Figs. 4 and 11-13) having all of the recited elements including a insulating alumina (Al_2O_3) substrate (411, 1111, 1211, 1311) having two faces (as recited in claim 3), a plurality of separate sensor elements (401-406, 1101-

1106, 1201-1206, 1301-1304) having respective contact pads, all applied to a single face, each sensor being made from thin semiconductor film (see Table 1) of different metal oxides, a resistive heating element capable of heating to a predetermined temperature (e.g. 400 °C) the substrate and the semiconductor film applied to it, the heating element being applied to the single face of the substrate (see Iwanaga et al.: col. 5, lines 30-32). Although Iwanaga et al. do not specifically show or disclose contact pads for the connection of an electrical power source, these are considered to be inherent features, since the resistance heater must have a connection means to a power source in order to operate/function).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,457,161 to Iwanaga et al. as applied to claims 1 and 2 above and in further view of US 4,984,446 to Yagawara et al.. Iwanaga et al. disclose a gas sensor having all of the elements previously recited, including the employment of an alumina substrate. Iwanaga et al. further disclose that other types of materials may be employed for the substrate (Table 3) including the element silicon to provide the proper insulation necessary for the gas sensor to function, however, do not explicitly disclose the employment of an insulating layer in combination with the silicon substrate. Yagawara et al. disclose a gas sensor that employs a pure silicon substrate (Fig. 7)

(101) and employing a silicon dioxide (106) is applied to the entire surface of the silicon substrate (Fig. 7D). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the obvious variant of a silicon substrate and an insulating layer, as taught by Yagawara et al., modifying the gas sensor disclosed by Iwanaga et al., thus providing the necessary insulation between the sensor components and the substrate.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,457,161 to Iwanaga et al. as applied to claims 1 and 2 above. Iwanaga et al. disclose a gas sensor having all of the elements previously recited, however, do not specifically disclose the substrate having a surface area between 1 and 25 mm² or between 4 mm² and 9 mm². However, it is considered well known in the art to vary the film surface area, as well as the semiconductor electrode sizes based on power consumption, attachment/space for contacts/leads, sensitivity (i.e. amount of electrode area is directly proportional to sensitivity). Furthermore, Applicant has not stated the criticality of the particular dimensions recited in claim 5. In cases like the present, where patentability is said to be based upon particular chosen dimensions or upon another variable recited within the claims, applicant must show that the chosen dimensions are critical. As such, the claimed dimensions appear to be an obvious matter of engineering design choice (for the reasons stated above) and thus, while being a difference, does not serve in any way to patentably distinguish the claimed invention from the applied prior art. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990); *In re Kuhle*, 526 F.2d 553, 555, 188 USPQ 7, 9 (CCPA 1975).

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,457,161 to Iwanaga et al. as applied to claims 1 and 2 above and in further view of US 6,786,076 to

Raisanen. Iwanaga et al. disclose a gas sensor having all of the elements previously recited, however, do not specifically disclose the resistive element presenting a serpentine pattern with a plurality of curves. Raisanen discloses a gas sensor having electrodes in a serpentine pattern with a plurality of curves (see Fig. 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a serpentine pattern having a plurality of curves for the resistive element, as taught by Raisanen, thus providing a consistent heating pattern over an area as well as to achieve an adequate resistance through the element while reducing the size of the gas sensor disclosed by Iwanaga et al. (Raisanen: col. 5, lines 37-44).

9. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,457,161 to Iwanaga et al. as applied to claims 1 and 2 above. Iwanaga et al. disclose a gas sensor having all of the elements previously recited, however, do not specifically disclose the contact pads being formed with a first layer of titanium or tungsten, and a second superimposed layer of platinum. However, it is considered well known in the art that the choice of electrodes (and their layer composition) is based upon adhesion properties to the substrate (i.e. the improvement thereof) as well as the overall resistance (electrical property) of the contact pad itself. In addition, Applicant has not stated the criticality of the particular elements employed in two layers in relation to the functionality of the instant invention, and, as such, is considered to be an obvious variant to employ any particular type of metals having the required electrical properties (i.e. conductance, resistance, etc.) for the contact pads.

Allowable Subject Matter

10. Claims 7 and 10-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is invited to review PTO form 892 accompanying this Office Action listing Prior Art relevant to the instant invention cited by the Examiner.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Fitzgerald whose telephone number is (571) 272-2843. The examiner can normally be reached on Monday-Friday from 7:00 AM to 3:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams, can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you

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have questions on access to the Private PAIR system, contact the Electronic Business Center
(EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "John Fitzgerald", with a long horizontal line extending to the right.

John Fitzgerald
01/06/2008